## ABSTRACT

A channel estimation section 112 estimates the states of channels used for pieces of mobile station apparatus (A) and (B), using signals demodulated by radio

5  processing sections 110, 111. A best SIR calculation section 118 calculates coefficients to be used for signal transformation by inverse matrix calculation, using the above channel estimation values by the above channel estimation section 112. A signal transformation section

10  119 performs linear transformation of transmission signals to the above pieces of mobile station apparatus, using the above coefficients from the above best SIR calculation section 118. Radio processing sections 120, 121 modulates each transmission signal after the above

15  linear transformation for transmission through antennas 108, 109, respectively.